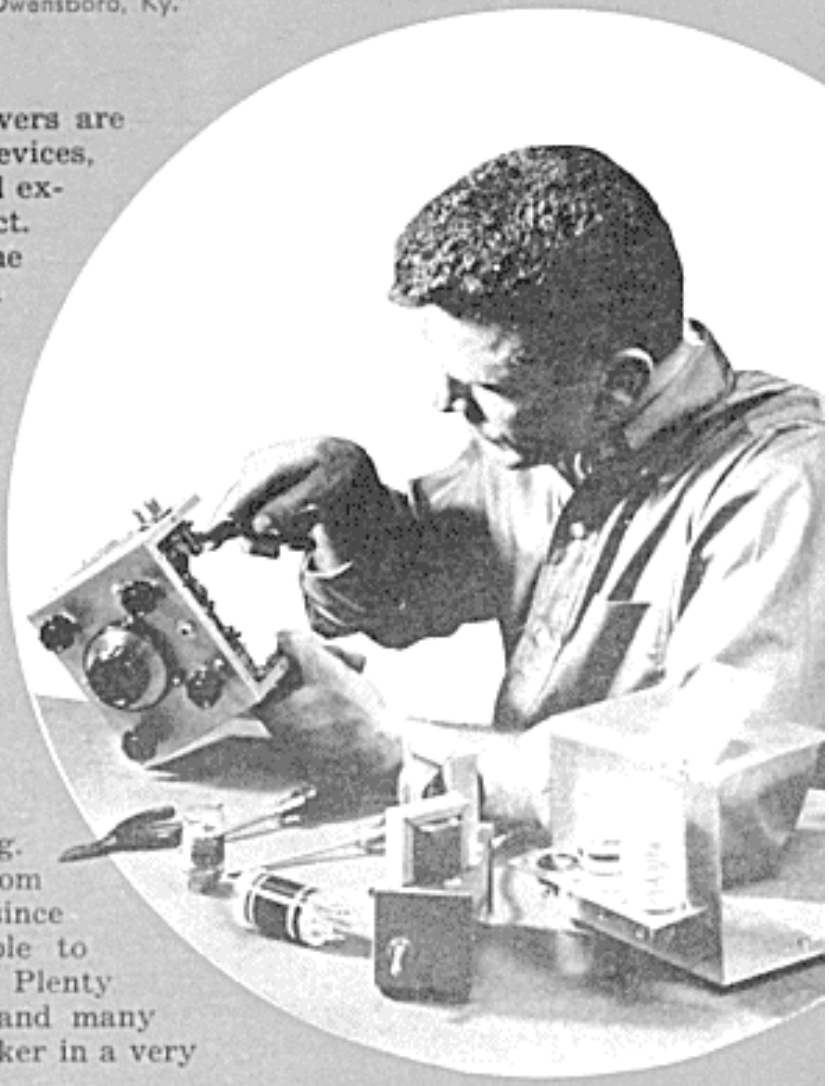
thanks to plug-in coils...

ONE RECEIVER ALL BANDS

By PHILIP E. HATFIELD, W9GFS
Receiving Tube Dept. General Electric Co., Owensboro, Ky.

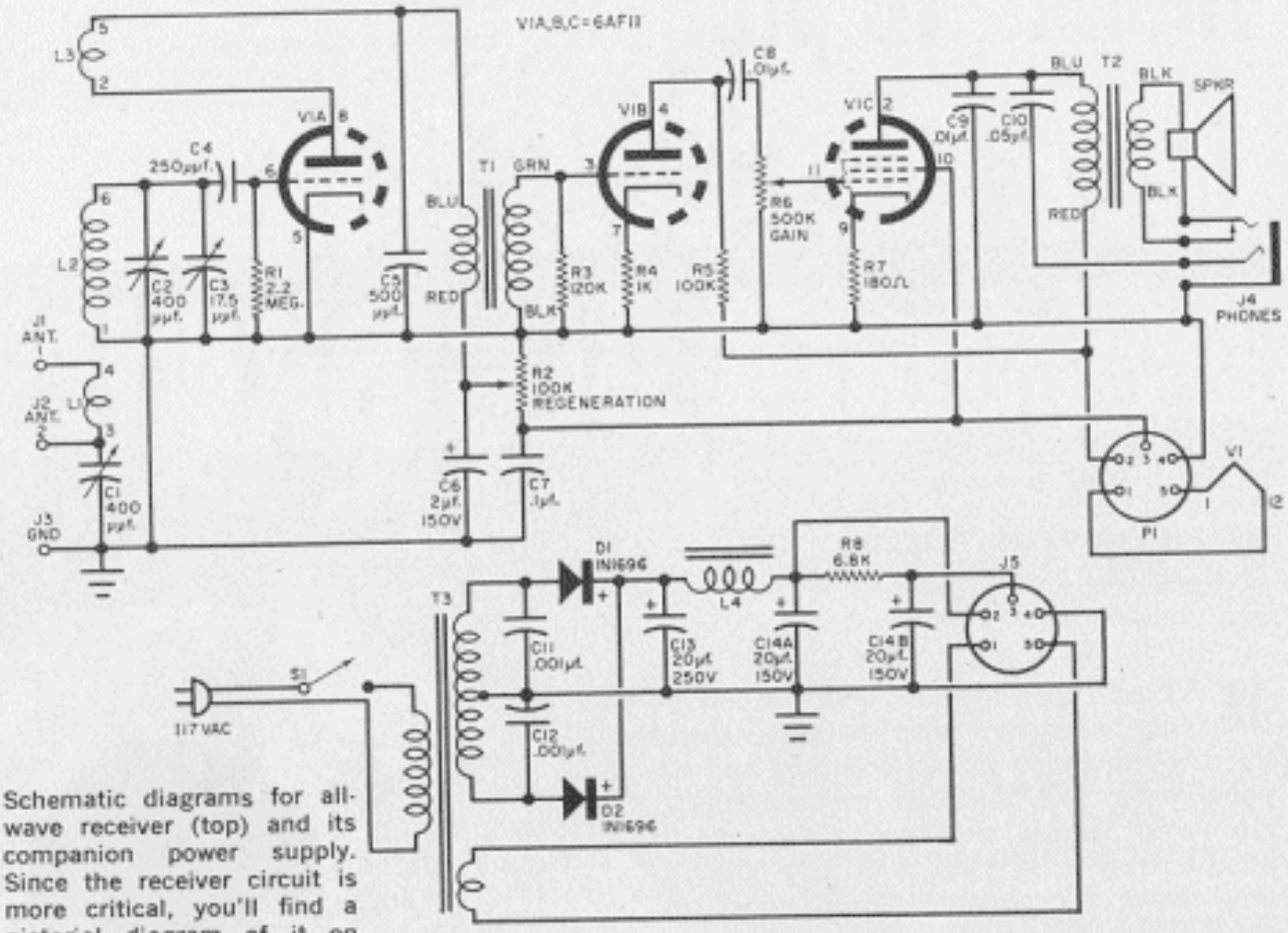


MOST of today's short-wave receivers are truly sensitive and reliable devices, but they are also rather complex and expensive for the beginner to construct. Here's a simple receiver, using one compactron tube, that will give you long-wave, broadcast-band, *and* short-wave reception. If you are considering putting your first receiver together, this one is for you. If you have an amateur-band-only receiver, this unit will fill in some of the "holes" in the spectrum. Finally, if you already have a general-coverage receiver, this set will make a good "auxiliary" to tuck away on a corner of the desk just in case your "big" one quits.

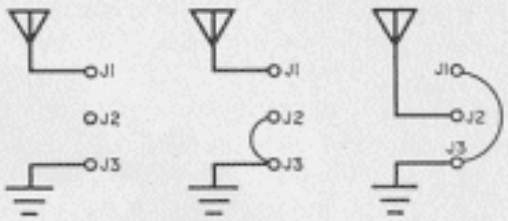
Use of a compactron allows a lot of receiver to be contained in a small box without undue crowding. The frequency range covered is from 250 kc. all the way to 16 mc.; and, since plug-in coils are used, it's possible to extend the range in either direction. Plenty of headphone volume is provided, and many signals will operate the built-in speaker in a very satisfactory manner.

The Circuit. The 6AF11 compactron contains two triodes and a pentode. One triode is used as a regenerative detector, the other as an audio voltage amplifier, and the pentode as an audio power amplifier.

Plug-in coils containing primary (*L1*), secondary (*L2*), and tickler (*L3*) windings determine the frequency range. Tuning is done with a relatively large variable capacitor (*C2*) to allow covering a wide range of fre-



Schematic diagrams for all-wave receiver (top) and its companion power supply. Since the receiver circuit is more critical, you'll find a pictorial diagram of it on page 81; you should be able to wire up the power supply without difficulty by following parts layout shown in photos on pages 82 and 83.

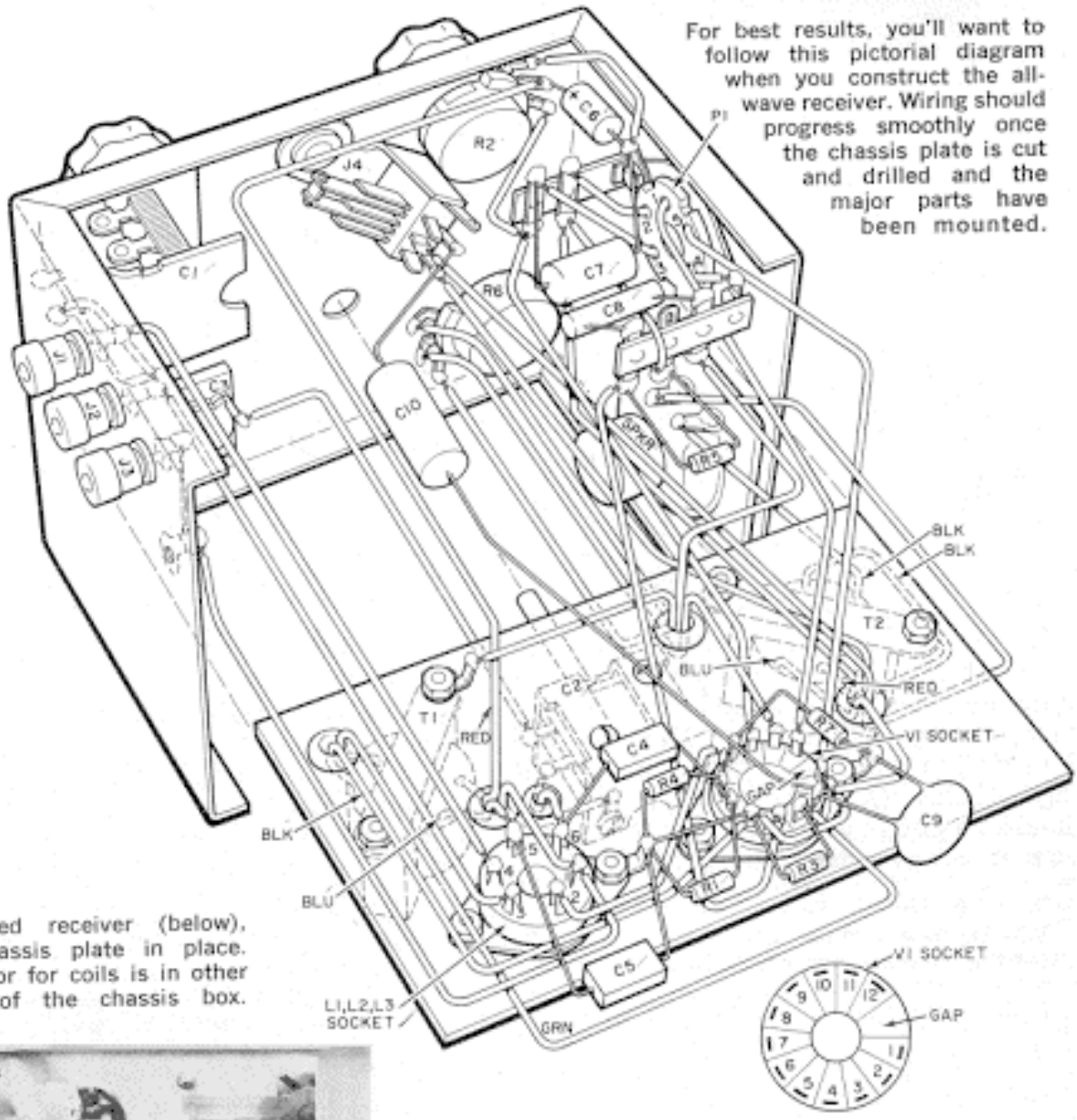


Versatility is the word on antenna hookups for this receiver, and three possible configurations appear at left.

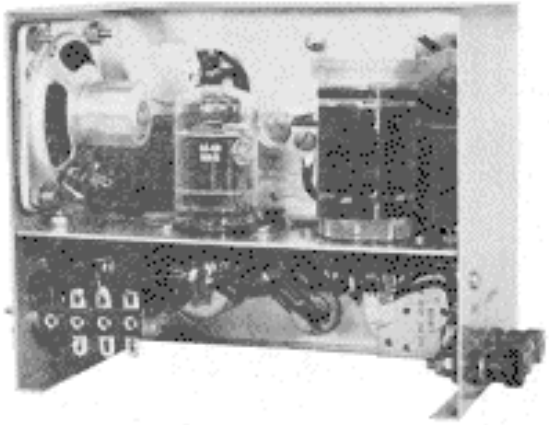
PARTS LIST

C1, C2—400-μμf. variable capacitor (Allied 61 L 009 or equivalent)
C3—17.5-μμf. variable capacitor (Hammarlund HF-15 or equivalent)
C4—250-μμf. mica capacitor
C5—500-μμf. mica capacitor
C6—2-μf., 150-w.v.d.c. electrolytic capacitor
C7—0.1-μf., 400-volt paper capacitor
C8, C9—0.01-μf., 1000-volt ceramic capacitor
C10—0.05-μf., 400-volt paper capacitor
C11, C12—0.001-μf., 1000-volt ceramic capacitor
C13—20-μf., 250-w.v.d.c. electrolytic capacitor
C14a/C14b—Dual 20/20-μf., 150-w.v.d.c. electrolytic capacitor
D1, D2—1N1696 diode
J1, J2, J3—Insulated binding post
J4—"Closed and transfer" phone jack (Mallory 703B or equivalent)
J5—5-prong socket
L1, L2, L3—Plug-in coil—see page 82 for details
L4—20-henry, 15-ma. choke (Chicago-Stancor C-1515 or equivalent)
P1—5-prong plug
R1—2.2-megohm, ½-watt resistor
R2—100,000-ohm potentiometer, linear taper
R3—120,000-ohm, ½-watt resistor
R4—1000-ohm, ½-watt resistor
R5—100,000-ohm, ½-watt resistor
R6—500,000-ohm potentiometer, audio taper
R7—180-ohm, 1-watt resistor
R8—6800-ohm, 1-watt resistor
S1—S.p.s.t. toggle switch
SPKR—2½" PM speaker, 3.2-ohm voice coil
T1—Interstage transformer, 1:3 turns ratio (Chicago-Stancor A-53 or equivalent)
T2—Output transformer: primary, 10,000 ohms; secondary, 4 ohms (Stancor A3879 or equivalent)
T3—Power transformer: primary, 117 volts a.c.; secondaries, 250 volts CT @ 25 ma. and 6.3 volts @ 1.0 amp (Stancor PS-8416 or equivalent)
V1—6AF11 tube
4—Six-prong coil forms, 1¾" in diameter, 2¾" long (Allied 71 H 724 or equivalent)
1—6" x 5" x 4" chassis box (LMB T-F781 or equivalent)
1—5" x 2¼" x 2¼" chassis box, gray hammertone finish (Bud CU-2104-A or equivalent)
4—6-pin sockets
Misc.—Dial, knobs, aluminum for chassis, wire for coils, hookup wire, socket for V1, line cord and plug, 5-conductor power cable with 5-pin socket and plug, hardware, solder, etc.

For best results, you'll want to follow this pictorial diagram when you construct the all-wave receiver. Wiring should progress smoothly once the chassis plate is cut and drilled and the major parts have been mounted.



Completed receiver (below), with chassis plate in place. Trap door for coils is in other "half" of the chassis box.

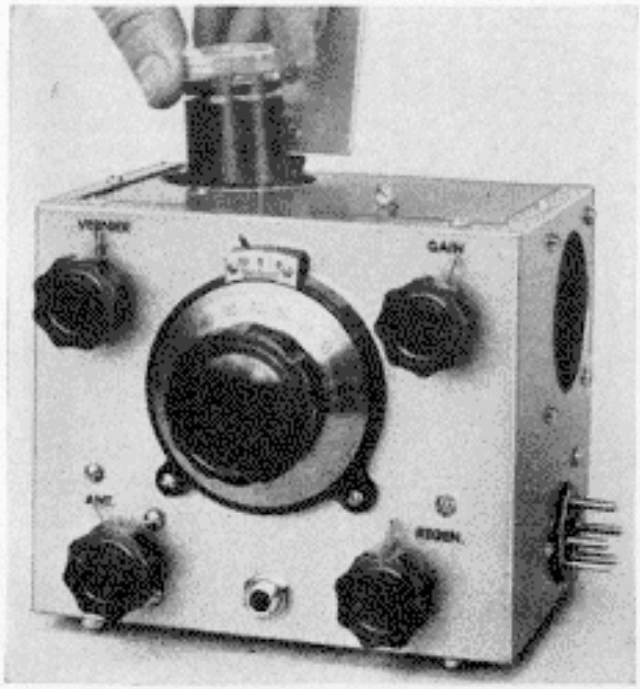


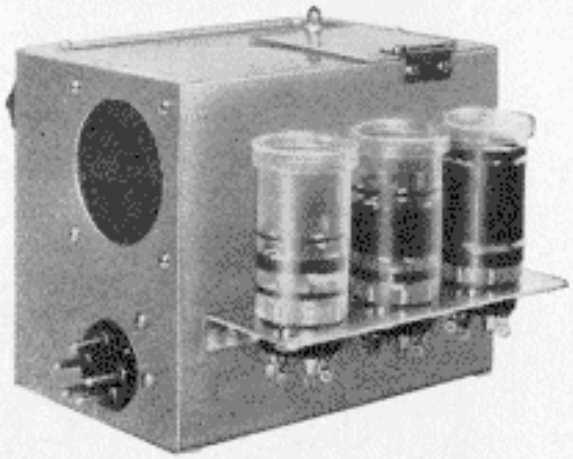
quencies with a minimum of coils. For fine tuning, a small variable capacitor (*C3*) is connected in parallel with the larger one to act as a "vernier."

The antenna coupling circuit is purposely designed for versatility. Straight inductive coupling, series tuning, or parallel tuning are possible, depending on the connections to jacks *J1*, *J2*, and *J3* (see antenna hookup diagram at left). This can be quite helpful in increasing the selectivity of the receiver and in tuning out the "dead spots" that afflict most regenerative receivers.

For maximum audio output, the headphones are operated from the pentode section of the compactron, and the phone jack (*J4*) is arranged to disconnect the speaker when the phones are in use.

The Receiver. All parts of the receiver, with the exception of the spare-coil rack, and the trap door for coil changing, are mounted on the portion of the chassis box used to form the front panel and sides. As the photos show, this makes all parts of the receiver readily accessible to the builder. In addition, since no electrical components are mounted on the removable portion of the box, all the testing that is necessary can be done





No likelihood of losing coils with this set—one, inserted through a trap door (far left), is always in use; the other three (above) rest in empty sockets mounted on aluminum flange at rear of cabinet.

before the cabinet is "buttoned up."

To reduce sheet metal bending to a minimum, the chassis proper is a flat plate, cut to make a fairly snug fit, and then fastened in place with four small angle brackets. All mounting holes should be cut in this plate and the chassis box before the plate is bolted in place.

After the holes have been drilled, all of the parts should be mounted, since they are all readily accessible for wiring in any sequence. In mounting the 400-$\mu\mu$f. antenna tuning capacitor (*C1*), flat washers should be used between the panel and the capacitor frame to insure that the screws don't extend through the

Winding data for receiver's four plug-in coils appears below. All of them are close-wound, except for the long-wave coil (250-600 kc.) at far right; full information on how to wind this particular coil appears in text. Vary spacing (d2) on the first three coils by sliding L3 back and forth on the form until regeneration seems "smoothest," then apply cement to hold coils in place.

	4.8-16.0 mc.	*1.75-6.1 mc.*	*510-1750 kc.*	*250-600 kc.*
L1	5 turns #26 enameled	8 turns #26 enameled	18 turns #30 enameled	30 turns #28 DCC
d1	¼"	3/16"	⅛"	
L2	8 turns #22 enameled	25 turns #22 enameled	100 turns #30 enameled	200 turns #28 DCC
d2	¼"	3/16"	1/16"	
L3	3 turns #26 enameled	4 turns #26 enameled	8 turns #30 enameled	10 turns #28 DCC